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3	21927	709/201-203,224-227,229-249.ccls.	USPAT; US-PGPUB; EPO; JPO	2004/10/29 07:47
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8	111	709/201-203,224-227,229-249.ccls. and (MAC near5 header) and bandwidth and combin\$3 and (network near5 card)	USPAT; US-PGPUB; EPO; JPO	2004/10/29 07:49
-	1	("20040111663").PN.	USPAT; US-PGPUB	2004/10/29 07:46
-	1	("20030206561").PN.	USPAT; US-PGPUB	2004/10/21 15:57
-	1	("20020022551").PN.	USPAT; US-PGPUB	2004/10/21 15:58
-	1	("20020006174").PN.	USPAT; US-PGPUB	2004/10/21 15:59
-	1	("20020003792").PN.	USPAT; US-PGPUB	2004/10/21 16:00
-	1	("6458060").PN.	USPAT; US-PGPUB	2004/10/21 16:00
-	1	("6560221").PN.	USPAT; US-PGPUB	2004/10/21 16:02
-	1	("6650639").PN.	USPAT; US-PGPUB	2004/10/21 16:03
-	1	("6516352").PN.	USPAT; US-PGPUB	2004/10/21 16:06
-	1	("6697372").PN.	USPAT; US-PGPUB	2004/10/21 16:06



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Relevance scale ☐ ☐ ☐ ☐ ☐**1** [Design methodology for PicoRadio networks](#)

J. da Silva, J. Shamberger, M. Ammer, C. Guo, S. Li, R. Shah, T. Tuan, M. Sheets, J. Rabaey, B. Nikolic, A. Sangiovanni-Vincentelli, P. Wright

March 2001 **Proceedings of the conference on Design, automation and test in Europe**Full text available: [pdf\(328.60 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)**2** [Network processors: a perspective on market requirements, processor architectures and embedded S/W tools](#)

P. Paulin, F. Karim, P. Bromley

March 2001 **Proceedings of the conference on Design, automation and test in Europe**Full text available: [pdf\(269.19 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)**3** [Applications, services, and architecture: Supporting real-time speech on wireless ad hoc networks: inter-packet redundancy, path diversity, and multiple description coding](#)
Chi-hsien Lin, Hui Dong, Upamanyu Madhow, Allen Gersho
October 2004 **Proceedings of the 2nd ACM international workshop on Wireless mobile applications and services on WLAN hotspots**Full text available: [pdf\(554.02 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We consider the problem of supporting real-time traffic over packetized wireless ad hoc networks. Our specific emphasis is on speech, since this is a critical application in many scenarios such as emergency deployment of ad hoc networks. Standard retransmission-based Medium Access Control (MAC) strategies are poorly matched to speech applications, because the payload size for speech as well as for MAC-layer acknowledgements (ACKs) is small compared to the packet header, which contains a large ...

Keywords: 802.11, ad hoc, path diversity, real-time, speech, wireless**4** [Efficient use of memory bandwidth to improve network processor throughput](#)

Jahangir Hasan, Satish Chandra, T. N. Vijaykumar

May 2003 **ACM SIGARCH Computer Architecture News , Proceedings of the 30th annual international symposium on Computer architecture**, Volume 31 Issue 2Full text available: [pdf\(184.83 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

We consider the efficiency of packet buffers used in packet switches built using network processors (NPs). Packet buffers are typically implemented using DRAM, which provides


plentiful buffering at a reasonable cost. The problem we address is that a typical NP workload may be unable to utilize the peak DRAM bandwidth. Since the bandwidth of the packet buffer is often the bottleneck in the performance of a shared-memory packet switch, inefficient use of available DRAM bandwidth further reduces th ...

5 Kernel Korner: Network Buffers and Memory Management
October 1996 **Linux Journal**

Full text available:  [html\(46.60 KB\)](#) Additional Information: [full citation](#), [index terms](#)




6 The effects of asymmetry on TCP performance
Hari Balakrishnan, Randy H. Katz, Venkata N. Padmanabhan
October 1999 **Mobile Networks and Applications**, Volume 4 Issue 3

Full text available:  [pdf\(382.76 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)



In this paper, we study the effects of network asymmetry on end-to-end TCP performance and suggest techniques to improve it. The networks investigated in this study include a wireless cable modem network and a packet radio network, both of which can form an important part of a mobile ad hoc network. In recent literature (e.g., [18]), asymmetry has been considered in terms of a mismatch in bandwidths in the two directions of a data transfer. We generalize this notion of bandwidth asymmetry t ...


7 Building a robust software-based router using network processors
Tammo Spalink, Scott Karlin, Larry Peterson, Yitzchak Gottlieb
October 2001 **ACM SIGOPS Operating Systems Review , Proceedings of the eighteenth ACM symposium on Operating systems principles**, Volume 35 Issue 5

Full text available:  [pdf\(1.49 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)



Recent efforts to add new services to the Internet have increased interest in software-based routers that are easy to extend and evolve. This paper describes our experiences using emerging network processors---in particular, the Intel IXP1200---to implement a router. We show it is possible to combine an IXP1200 development board and a PC to build an inexpensive router that forwards minimum-sized packets at a rate of 3.47Mpps. This is nearly an order of magnitude faster than existing pure PC-base ...

8 The state of the art in locally distributed Web-server systems
Valeria Cardellini, Emiliano Casalicchio, Michele Colajanni, Philip S. Yu
June 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 2

Full text available:  [pdf\(1.41 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)




The overall increase in traffic on the World Wide Web is augmenting user-perceived response times from popular Web sites, especially in conjunction with special events. System platforms that do not replicate information content cannot provide the needed scalability to handle large traffic volumes and to match rapid and dramatic changes in the number of clients. The need to improve the performance of Web-based services has produced a variety of novel content delivery architectures. This article w ...

Keywords: Client/server, World Wide Web, cluster-based architectures, dispatching algorithms, distributed systems, load balancing, routing mechanisms

9 Software support for outboard buffering and checksumming
Karl Kleinpaste, Peter Steenkiste, Brian Zill
October 1995 **ACM SIGCOMM Computer Communication Review , Proceedings of the conference on Applications, technologies, architectures, and protocols**



for computer communication, Volume 25 Issue 4Full text available:  [pdf\(1.22 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Data copying and checksumming are the most expensive operations when doing high-bandwidth network IO over a high-speed network. Under some conditions, outboard buffering and checksumming can eliminate accesses to the data, thus making communication less expensive and faster. One of the scenarios in which outboard buffering pays off is the common case of applications accessing the network using the Berkeley sockets interface and the Internet protocol stack. In this paper we describe the changes t ...

10 A scalable wireless virtual LAN


Zhao Liu, Malathi Veeraraghavan, Kai Y. Eng

September 1998 **Mobile Networks and Applications**, Volume 3 Issue 3Full text available:  [pdf\(300.90 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper presents a Wireless Virtual Local Area Network (WVLAN) to support mobility in IP-over-ATM local area networks. Mobility is handled by a joint ATM-layer handoff for connection rerouting and MAC-layer handoff for location tracking, such that the effects of mobility are localized and transparent to the higher-layer protocols. Different functions, such as Address Resolution Protocol (ARP), mobile location, and ATM connection admission are combined to reduce protocol overhead and from ...

11 A scalable wireless virtual LAN

Zhao Liu, Malathi Veeraraghavan, Kai Y. Eng

November 1996 **Proceedings of the 2nd annual international conference on Mobile computing and networking**Full text available:  [pdf\(1.25 MB\)](#)Additional Information: [full citation](#), [references](#), [index terms](#)**12** Wireless ATM MAC performance evaluation, a case study: HIPERLAN type 1 vs. modified MDR


Jouni Mikkonen, Liina Nenonen

September 1998 **Mobile Networks and Applications**, Volume 3 Issue 3Full text available:  [pdf\(573.89 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper deals with wireless ATM and in particular with MAC (Medium Access Control) mechanisms. The requirements for wireless ATM MAC are discussed, and contention-based and TDMA/reservation based MAC protocols are compared. The objective is to find out the suitability of current wireless MAC schemes for ATM interworking, in comparison to new wireless ATM MAC proposals. Two candidate mechanisms, EY-NPMA used in HIPERLAN type 1, and a modified MDR protocol, are discussed in more detail and ...

13 The effects of asymmetry on TCP performance

Hari Balakrishnan, Venkata N. Padmanabhan, Randy H. Katz

September 1997 **Proceedings of the 3rd annual ACM/IEEE international conference on Mobile computing and networking**Full text available:  [pdf\(2.02 MB\)](#)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)**14** MR²RP: the multi-rate and multi-range routing protocol for IEEE 802.11 ad hoc wireless networks

Shiann-Tsong Sheu, Yihjia Tsai, Jenhui Chen

March 2003 **Wireless Networks**, Volume 9 Issue 2Full text available:  [pdf\(252.69 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper discusses the issue of routing packets over an IEEE 802.11 *ad hoc* wireless network with multiple data rates (1/2/5.5/11 Mb/s). With the characteristics of modulation schemes, the data rate of wireless network is inversely proportional with the transmission distance. The conventional shortest path of minimum-hops approach will be no longer suitable for the contemporary multi-rate/multi-range wireless networks (MR²WN). In this paper, we will propose an efficient delay- ...

Keywords: ad hoc, local area network (LAN), medium access control (MAC), routing, wireless

15 The transport layer: tutorial and survey

Sami Iren, Paul D. Amer, Phillip T. Conrad

December 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 4

Full text available:  [pdf\(261.78 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Transport layer protocols provide for end-to-end communication between two or more hosts. This paper presents a tutorial on transport layer concepts and terminology, and a survey of transport layer services and protocols. The transport layer protocol TCP is used as a reference point, and compared and contrasted with nineteen other protocols designed over the past two decades. The service and protocol features of twelve of the most important protocols are summarized in both text and tables. < ...

Keywords: TCP/IP networks, congestion control, flow control, transport protocol, transport service

16 MAC protocol and traffic scheduling for wireless ATM networks

Nikos Passas, Lazaros Merakos, Dimitris Skyrianoglou, Frédéric Bauchot, Gérard Marmigère, Stéphane Decrauzat

September 1998 **Mobile Networks and Applications**, Volume 3 Issue 3

Full text available:  [pdf\(802.71 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The Medium Access Control (MAC) protocol defined in the Wireless ATM Network Demonstrator (WAND) system being developed within the project Magic WAND is presented. Magic WAND is investigating extensions of ATM technology to cover wireless customer premises networks, in the framework of the Advanced Communications Technologies and Services (ACTS) programme, funded by the European Union. The MAC protocol, known as MASCARA, uses a dynamic TDMA scheme, which combines reservation- and contention ...

17 Emerging areas: Programming challenges in network processor deployment

Chidamber Kulkarni, Matthias Gries, Christian Sauer, Kurt Keutzer

October 2003 **Proceedings of the 2003 international conference on Compilers, architectures and synthesis for embedded systems**

Full text available:  [pdf\(234.71 KB\)](#)


Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Programming multi-processor ASIPs, such as network processors, remains an art due to the wide variety of architectures and due to little support for exploring different implementation alternatives. We present a study that implements an IP forwarding router application on two different network processors to better understand the main challenges in programming such multi-processor ASIPs. The goal of this study is to identify the elements central to a successful deployment of such systems based on ...

Keywords: IPv4 forwarding, mapping, multi-threading, programming heterogeneous architectures, programming model, resource sharing

18 A high performance transparent bridge

Martina Zitterbart, Ahmed N. Tantawy, Dimitrios N. Serpanos

August 1994 **IEEE/ACM Transactions on Networking (TON)**, Volume 2 Issue 4Full text available:  pdf(1.41 MB) Additional Information: [full citation](#), [references](#), [index terms](#)**19** Balancing performance and flexibility with hardware support for network architectures

Ilija Hadžić, Jonathan M. Smith

November 2003 **ACM Transactions on Computer Systems (TOCS)**, Volume 21 Issue 4Full text available:  pdf(719.03 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The goals of performance and flexibility are often at odds in the design of network systems. The tension is common enough to justify an architectural solution, rather than a set of context-specific solutions. The Programmable Protocol Processing Pipeline (P4) design uses programmable hardware to selectively accelerate protocol processing functions. A set of field-programmable gate arrays (FPGAs) and an associated library of network processing modules implemented in hardware are augmented with so ...

Keywords: FPGA, P4, computer networking, flexibility, hardware, performance, programmable logic devices, programmable networks, protocol processing

20 Design of an ATM-FDDI gateway

Sanjay Kapoor, Gurudatta M. Parulkar

August 1991 **ACM SIGCOMM Computer Communication Review , Proceedings of the conference on Communications architecture & protocols**, Volume 21 Issue 4Full text available:  pdf(962.57 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

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1 Impact of header error on EGPRS link level performance in IR mode

Molkdar, D.; Lambotharan, S.;

3G Mobile Communication Technologies, 2001. Second International Conference on (Conf. Publ. No. 477) , 26-28 March 2001

Pages:114 - 118

[\[Abstract\]](#) [\[PDF Full-Text \(380 KB\)\]](#) **IEEE CNF**

2 Distributed on-demand address assignment in wireless sensor networks

Schurgers, C.; Kulkarni, G.; Srivastava, M.B.;

Parallel and Distributed Systems, IEEE Transactions on , Volume: 13 , Issue: 10 , Oct. 2002

Pages:1056 - 1065

[\[Abstract\]](#) [\[PDF Full-Text \(2473 KB\)\]](#) **IEEE JNL**

3 Adaptive frame length control for improving wireless link throughput, range, and energy efficiency

Lettieri, P.; Srivastava, M.B.;

INFOCOM '98. Seventeenth Annual Joint Conference of the IEEE Computer and Communications Societies. Proceedings. IEEE , Volume: 2 , 29 March-2 April 1998

Pages:564 - 571 vol.2

[\[Abstract\]](#) [\[PDF Full-Text \(968 KB\)\]](#) **IEEE CNF**
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Net Solutions LLC - 9/21/99 # # Flint DOUNGCHAK (flint ...

... n"); fwrite(\$DECRYPTinFD,\$mac,strlen(\$mac)); fwrite(\$DECRYPTinFD ... **buffer**; else \$ccres .=
\$buffer; } # echo \$ccres ... **Header**("Location: ./complete.html"); else: # If ...
 px.sklar.com/code.html?id=221&fmt=pl - 8k - [Cached](#) - [Similar pages](#)

[PPT] File System Organization

File Format: Microsoft Powerpoint 97 - [View as HTML](#)

... We can **combine** file systems by mounting. ... treat the block as an indirect block pbn =
 ((IndirectBlock *)(**header->buffer**))[lbn]; FreeDiskBlock(**header**); return ...
 www.cs.unm.edu/~crowley/osbook/slides/chap17.ppt - [Similar pages](#)

404 Object Not Found

... the payload of the frame, with a special **header** that includes ... save the entire packet
 to the **buffer** and check ... Otherwise, the switch looks up the **MAC** address and ...
 www22.verizon.com/about/community/learningcenter/articles/displayarticle1/0,1727,1028z3,00.html - 47k -
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Optimizing Network Interface Cards for Operation in a Standard ...

... The **MAC header** is 16 bytes, requiring only a four ... **IP header** is 40 bytes without TCP
header options, requiring a ... Ethernet packets in sequence to the same **buffer**. ...
 www.techonline.com/community/ed_resource/feature_article/20025?print - 20k - [Cached](#) - [Similar pages](#)

Commands in different NUTS versions

... included to indicate those commands that are implemented on the **Mac**. ... L, 1, 2, Pro,
 M, Transfer current data to convolution **buffer**. ... E2, S, L, 1, 2, Pro, M, ASC **header** ...
 www.acornnmr.com/commands.htm - 101k - [Cached](#) - [Similar pages](#)

Tech. report - Header matching in Combo6

... away from the emptiness of the input **buffer** and the ... are the Source and the Destination
MAC addresses. ... Figure 3: Block structure of **header** matching engine and ...
 www.cesnet.cz/doc/techzpravy/2003/combo6-header-lookups/ - 37k - [Cached](#) - [Similar pages](#)

[PPT] MPLS Based Web Switching

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... Lookup route, next hop IP/MAC address. Add new **MAC header** (destination address C). ...
buffer. Enhancements to the 802.11 **MAC**. ... **MAC** enhancement : **combine** ACK and RTS. ...
 www.intel.com/education/highered/Wireless/lectures/L14-802.11_and_multihopping_lecture.ppt - [Similar pages](#)

Shortcuts..

... Source code for a SDL like "sound **buffer**" using only ... that are longer than stated
 in GXB **header** (ADS feature ... also gpstart.o, Inksript, a for your **Mac** OSX hosted ...
 www.cs.helsinki.fi/u/jikorhon/condev/gp32/download.html - 36k - [Cached](#) - [Similar pages](#)

[PPT] IPsec-Protected Transport of HTDV over IP

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... DMA / PCI. **MAC** ctrl. **MAC**. Fixed 1 Gbps "system" firmware. ... ZBT. **Header**. processing.
 Re-. ... Copy frame to user **buffer**. Copy frame to OS **buffer**. Recopy packet for IPsec ...
 klabs.org/richcontent/MAPLDCon03/presentations/a/a7_bellows_s.ppt - [Similar pages](#)

File Menu

... You will want to set Undo **Buffer** Size in Preferences to ... of 512 to skip over a 512

byte file **header**. ... files can be exported to many other **Mac** programs, including ...
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